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PRIORITY DOCUMENT
SUBMITTED OR TRANSMITTED IN COMPLIANCE WITH RULE 17.1(a) OR (b)

Patent Office
Canberra

I, JULIE BILLINGSLEY, TEAM LEADER EXAMINATION SUPPORT AND SALES hereby certify that annexed is a true copy of the Provisional specification in connection with Application No. PS 3314 for a patent by S4 TECHNOLOGY PTY LTD as filed on 01 July 2002.

WITNESS my hand this
Eleventh day of July 2003

JULIE BILLINGSLEY
TEAM LEADER EXAMINATION
SUPPORT AND SALES

Intelligent Printer Interface for Managing Data Content and Presentation

BACKGROUND

This invention relates to an intelligent electronic interface which receives a data stream, manipulates it to add content, enhance appearance or reformat, then outputs to a device such as a receipt printer.

The source of this data stream may be intentionally destined for a printer, such as receipt text as a point of sale (POS), or could be a device whose output is to be printed, but which requires further processing to be made printable, such as the output of a weigh-scale. The present invention will be described with reference to its application at POS terminals and more particularly in enhancing the content of a printer such as a receipt printer but it will be appreciated by persons skilled in the art that the invention can be applied to manipulation of data in other data transfer systems.

BACKGROUND ART

There are inexistence a wide variety of POS terminal systems which generally comprise a computer linked to a receipt printer. Sales transactions are processed on the computer and the receipt data for the consumer is printed at a receipt printer. Systems are known in which buyers transaction data at the POS is stored in a memory for future reference. A signal is generated which is representative of a customers shopping history. This allows incentive coupons to be issued to customers in dependence upon the signal.

A common application of small, low cost printers is for the production of receipts or dockets in locations such as supermarkets, petrol stations and general retail outlets.

Currently there exists a good graphic capability in most printers that is often completely ignored. These receipt printers are generally suitable to produce company logos, discount coupons, promotional material, gaming tickets such as lottery entries, and many other marketing tools; either as plain text, graphic image or mixed output.

However, these capabilities are not commonly exploited due to the point-of-sale (POS) equipment being of limited capability. Due to high costs, such as in equipment, training and software development, there are major barriers to the upgrading of a legacy POS system to include such capabilities. This is particularly significant where a company operates a multitude of different systems at different locations. Often the only option is complete replacement of the POS, although even current systems still offer little flexibility.

It is also a problem that the data stream may be incompatible with the connected printer. This could happen where a printer has been replaced with a newer model that has features the legacy software is unable to manage correctly. This is becoming a common occurrence as old dot-matrix printers are being replaced with thermal technologies.

Furthermore, statistical information about what, and when, data has been printed may also be of value to a business. This data may reveal customer demographics that simple sales totals fail to show. For example, a food outlet may get some indication of what customers are consuming for meals versus snacks and target marketing accordingly; e.g. food consumed for lunch is mostly purchased at lunch time.

DISCLOSURE OF INVENTION

It is one object of the present invention to address the foregoing problems or at least to provide the public with a useful choice. By concentrating intelligence in communication with a printer, and networking interfaces where appropriate, it is possible to manage a wide disparity of legacy systems across many sites. Through such a network it is possible to provide a range of marketing and presentation tools, and deliver these capabilities at an affordable price.

Where multiple printers are located at a single site, a site controller may be used to act as a single point of contact for the group. Data is communicated between a central server to

the site controller, which then disseminates the data via a wireless or wired network, or both, to the intelligent interfaces, and collects any statistical or other data for the server.

A further application lies in intelligent data acquisition. It may be that a print out from a data stream not intended to be directly printed is desired. An example of this is a weigh scale where a stream of weight data is output. To print a docket with this data currently requires an intervening computer system to capture the weight, format the data, and output to the printer. This could all be done through an intelligent printer device.

The invention according to one embodiment, typically takes an input data stream (from a data source), manipulates this data, and outputs a stream (to a data consumer). This output stream may be substantially altered and include data completely foreign to the input stream, but significantly may be affected by the specific content of the input stream. The output data may contain content that is pre-loaded into the interface, or obtained via some network connection in real-time from some external device, or some combination of both.

In one broad form the present invention comprises;

a system for adjusting data in a data stream: the system comprising ;

a source of electronic data,

a printer capable of performing at least one function responsive to said data stream;

means for interrupting and altering the data stream to enable the printer to thereby perform at least one additional print function.

In another broad form the present invention comprises;

a system for adjusting data in a data stream: the system comprising ;

a source of electronic data,

a printer capable of performing at least one function responsive to said data stream;

an interface for interrupting and adjusting the data stream to enable the printer to thereby perform at least one additional print function.

In another broad form the present invention comprises;

an electronic interface for insertion between a source of electronic data and a printer which performs at least one print function responsive to said data: wherein the interface includes means to interrupt and adjust said data stream so that the printer performs at least one other function responsive to said adjusted data.

In another broad form the present invention comprises:

a system for controlling the printing of data at a point of sale (POS) terminal, the system comprising:

a source of data producing a data stream;

a printer responsive to a POS computer and which performs at least one print function responsive to the data stream; the system further comprising at least an interface which is capable of adjusting said data in said data stream thereby allowing the printer to perform at least one other print function.

According to one embodiment, the interface is in communication with a remote server and the remote server is in communication with a controller which links one or more remote sites to the remote server.

The system further comprising at least an interface which is capable of adjusting said data in said data stream thereby allowing the printer to perform at least one other print function. Preferably the additional print function is based on POS information obtained by said interface directly or indirectly from the POS computer.

In another broad form of a method aspect the present invention comprises;

a method of adjusting data in a data stream transmitted between a source of data and a data printer, the method comprising the steps of ;

a) providing a source of electronic data,

b) providing a printer in communication with said source of data and capable of performing at least one function responsive to said data stream;

c) providing an interface between said source of data and said printer for interrupting the data stream to enable the printer to thereby perform at least one additional print function.

In another broad form the present invention comprises;

a method for adjusting data printed by a POS printer such that the adjustment causes the printer to perform at least one function additional to its predetermined functions; the method comprising the steps of ;

a) providing a source of electronic data emanating from at least one computer terminal,

b) providing at least one printer in communication with said computer terminal and which is capable of performing at least one function responsive to said data stream;

c) connecting an intelligent interface between said source of data and said at least one printer for interrupting the data stream to enable the printer to thereby perform at least one additional print function.

Preferably, the computer terminal is a cash register which delivers a data stream to a receipt printer. The data is manipulated, altered, augmented, amplified or otherwise adjusted via an interface which is either local to or remote from the printer. According to one embodiment the interface connection is wireless. According to an alternative embodiment, the interface connection is wired. In the case where multiple printers are

used in a multiple POS site, a controller is used either at the POS site or at a remote location thereby enabling control of multiple printers.

Further aspects and advantages of the present invention will become apparent from the ensuing description which is given by way of example only.

DETAILED DESCRIPTION

For the purposes of this disclosure, consider the example of a POS terminal (or cash register) as a data source, and the receipt printer of the POS terminal as a data consumer. This is a typical but not exclusive application of the invention as other data sources, such as POS journal outputs, and other data consumers, such as loyalty or statistical systems, may be connected instead. It is also possible that while many applications of this technology consist of an intelligent device between data source and data consumer, it may also be configured such that the intelligent interface is connected in parallel with an existing printer, and promotional data is fed to a separate printer or device.

A typical existing system has a POS terminal communicating directly with a receipt printer. Through the addition of the invention, connected between POS terminal and receipt printer (such as in one embodiment), the receipt printer output may be enhanced to include many promotional instruments such as discount vouchers, advertising, lottery entries et al.. Statistical data may additionally be collated and made available to an external system by means of a network connection of some kind. Where the data contained in the receipt needs to be parsed (such as when looking for the purchase of a specific product), there exists the requirement that the input data contains plain text (as opposed to some graphic representation of such text). However, in most POS implementations, data is able to be output to the printer in a simple text format, such as ASCII. As such, this information is easily readable and the content quickly determined.

Various embodiments of the invention are described below;

1. As a separate physical device existing external to both data source and data consumer, with some provision for wired or wireless network connection.
2. As an intelligent interface module that may be physically housed fully or partially within the data consumer itself with some provision for wired or wireless network connection.
3. As a data consumer device with the facilities of the invention built in to its internal electronics, and with some provision for wired or wireless network connection.
4. As one of the preceding embodiments intercepting the incoming data stream, transmitting this data to an external processor through a network, receiving a manipulated data stream from a network, and outputting this data to the data consumer. This approach is characteristic of a 'thin client' approach.

The wired or wireless network connection enables a site controller to manage each intelligent module such that data content may be altered or statistical data retrieved. The invention does not require a network connection in all cases, but typically a network will be used to gain the greatest benefit from it as the configuration of the interfaces (i.e. the rules of operation) is then able to be administered remotely.

One present embodiment is of the first form, where data source and data consumer connections are RS232 format, and the network connection is optionally RS485 format or wireless. Another embodiment is of the same form, but with parallel source/consumer connections.

Many modern receipt printers feature an internal storage area into which graphic images may be loaded. This feature is used to provide the facility to print graphic images very quickly. Often this facility is ignored because; the programming of this data is technically difficult for untrained people; the POS systems do not support or only support this feature for logo printing; it is time consuming to update, particularly where there are a large

number of printers. A feature of the intelligent modules is that they provide an easy and convenient way to update a large number of printers with internally stored graphic data.

A typical update scenario where the intelligent interface module is used to generate discount vouchers in a retail store environment using the network connection capability of the modules would be;

1. The system administrator defines a set of graphics, and rules for their use. For example a coupon to be printed advertising a special offer on a product, printed when a competing product is purchased.
2. A remote computer connects to the store site controller, typically by modem or Internet.
3. The configuration data, including the graphic image and triggering condition definition, is downloaded to the site controller.
4. Statistical data held at the site controller is uploaded to the server for later analysis.
5. The server disconnects.
6. The site controller communicates with each intelligent module, downloading the newly received data.
7. The intelligent modules download the graphic image data directly to the internal storage memory of the printer. The rules of when to print the image are held in the module and processed there as needed.

Reference throughout this specification shall now be made to the use of an interface between a computer used in a retail operation and a receipt printer. However, as can be appreciated the present invention has wider uses and applications outside this particular application.

Applications of the intelligent interface are varied, and may be grouped as functions that address connectivity and basic device control, and functions that address presentation. The groups of functions are complimentary.

Connectivity and Device Control Functions

A new printer may be desired to replace a legacy one for a number of reasons. The old printer may have failed or performed unsatisfactorily. Unfortunately, the legacy POS system may not be capable of operating the new printer due to compatibility issues, or features such as duplicate printing (common on impact dot matrix printers, but unusual on modern thermal printers) are absent.

The intelligent interface is capable of;

1. Emulating an old-style dot matrix interface, and translating command codes for the new printer.
2. Automatically generating multiple copies.
3. Buffering data to avoid possible data loss and change baud rates or handshaking of serial connections.
4. Monitoring printer status and act accordingly. For example raise an alert on low paper.
5. Operating the paper cutter automatically. If a legacy system has been designed around a tear-bar printer, then it probably has no direct way to signal the new printer to perform a paper cut.
6. Operating the cash drawer kick feature automatically. If a legacy system has been designed around an old printer, then it probably has no direct way to signal the new printer to perform a cash drawer kick.

Presentation Functions

The intelligent interface module can be used to enhance the printer output in a number of ways.

1. Addition of standard headers and footers. Promotional features may be added to otherwise plain receipts such as a graphic company logo at the head of a receipt, and an attractive greeting at the foot. Such additional material may be printed regardless of other information appearing on the receipt.
2. Addition of context sensitive material. Promotional features or other data may be added to receipts that depend on the information appearing on the receipt. For

example, if a specific product is purchased, then a discount coupon may be automatically produced for a competing product. Alternatively, if the value of the transaction exceeds a certain figure, then a voucher for a reward of some kind could be produced. There are many promotional schemes that could be tied to products, value, transaction time, or any other data produced in the receipt. It is also possible that standard terms and conditions relating to a product (e.g. rental terms) or type of sale (e.g. hire purchase terms) may be desired to be automatically printed.

3. Addition of controls of printer functions. For example, the font may be made larger, the printing may be made bold or underlined. These features are trivially available in most printer architectures, but are often not used.

1. The additional output may be directed to the connected printer, or to some other printer or device.
2. The additional output may be data stored or generated by the intelligent interface, data stored in the printer memory, or data obtained in real-time through a network connection.
3. The interface can also be used to remove unnecessary or blank lines if desired in an effort to conserve paper. As can be appreciated, the volume of dockets produced can be considerable and the removal of some lines, as long as they do not detract from the readability of the docket, can make considerable savings.

Promotional Concepts Facilitated by the Intelligent Interface

Multitudes of promotional concepts are readily implemented by the use of the intelligent interface. They include, but are not limited to, any combination of;

1. Production of receipts containing graphic logos and static promotional material
2. Production of receipts containing promotional material based on product(s) purchased.
3. Production of receipts containing promotional material based on time of purchase.

4. Production of receipts containing promotional material based on total value of transaction.
5. The use of a connecting network to obtain promotional or other material in real-time for inclusion in output data.
6. The use of a connecting network to return statistical information to a network server.
7. The use of a connecting network to provide a means to readily update the promotional material stored in the intelligent interface and any associated printer, and to update the rules regarding the generation of output data.

Example applications of the intelligent interface include;

1. Generation of discount vouchers.
2. Generation of discount vouchers with regard to product purchases.
3. Implementation of a lottery where a lottery ticket is generated in response to a transaction value exceeding a threshold. Ticket details for which are sourced through a network connection or stored in an internal cache or generated internally.
4. Implementation of a prize-draw promotion where a stub ticket is printed. The winner to be drawn from a pool of entries.
5. Providing compatibility between modern hardware and legacy systems.

It can be seen that the present invention provides a number of advantages over the prior art. Some of these advantages include:

• Improved readability of dockets and receipts,

• Increased brand identification with graphic logos.

• Ability to read the data stream and extract and action any pre-defined instruction.

• Ability to insert Vouchers into the data-stream by activation of predetermined triggers in the data-stream.

• Ability to insert Gambling or gaming features by activation of predetermined triggers in the data-stream.

• Ability to insert vouchers and gambling/gaming features independent of the need for any input data-stream.

• Ability to download new control and display data.

• Is configurable to read from any source of the data-stream.

• Allows for a simple upgrade of an existing system independent of computer type (e.g. UNIX, IBM, Macintosh).

• Is configurable to support all printers with no changes to existing software systems software,

• Easy to configure for specific printers.

• May correct erroneous information, such as a changed address, without changing system software,

• May be configured at whim, so frequent changes are no problem and inexpensive.

• May save time and paper, depending on set up.

• Enable rapid deployment of new promotional material and infrastructure.

It should be appreciated that the format of the data being sent to the printer may be changed considerably by the present invention. For example, the interface may receive ASCII format text, but in terms of enhancement to the printer, may print a bar code. This could be used in situations where it is desired to label products, or provide a ticket which can be scanned for other uses e.g. car washes, lotteries, vouchers.

BRIEF DESCRIPTION OF DRAWINGS

Further aspects of the present invention will become apparent from the following description which is given by way of example only and with reference to the accompanying figure in which;

Figure 1 is a algorithm depicting one method by which the present invention can be operated.

Figure 2 is a simplified drawing of the data stream we are manipulating and how we do it for a typical application.

BEST MODES FOR CARRYING OUT THE INVENTION

In a preferred embodiment, the present invention is used in a retail situation to convert the output of a retail computer in such a way to produce- an enhanced output of a printer which would normally be connected directly to that retail computer.

In this embodiment, a data stream is output from the retail computer in ASCII format and received by the interface.

The interface then outputs control codes to the printer which cause the printer to print an enhanced output containing the manipulated data stream and if used the extra text and graphics.

It should be appreciated that by providing an interface that can plug in between the computer and the printer, changes to the printer output can be readily achieved without changing the system software of the retail computer.

Aspects of the present invention have been described by way of example only and it should be appreciated that modifications and additions may be made thereto without departing from the scope thereof.

Potential applications:

1 using existing magnetic cards (any one chosen such as visa to club card) to act as a loyalty card.

2 reading a bar code at a checkout to check if a lottery ticket is a winning one. The idea to do this is set out below.

Product for reading bar codes and redirecting the relevant data stream to the recast unit.

The use of the existing pos scanner to identify and redirect any relevant information away from the POS system and into the Recast unit to read a bar code directly.

For example, a Lottery ticket needs to be checked to see if is a winning ticket. The existing POS scanner reads the bar code. From the first few digits it can be identified if this products/information needs to be sent to the recast unit, left in its current state and sent to the POS system or both. For a lottery example the need to check if this is a winning ticket can be done at the checkout by reading the barcode on the lottery and then the ***"Recast redirect module"*** (a separate piece of hardware inserted between the existing scanner and POS input) removes this information from the output stream of the scanner and redirects to the Recast unit. This data is then processed by sending the information via the site controller to a remote lottery server which checks if it a winning lottery ticket. The result of the ticket (win/ loss) is then sent and is printed on the receipt printer or other output device.

It will be recognized by persons skilled in the art that numerous variations and modification may be made to the invention as broadly described herein without departing from the overall spirit and scope of the invention.

Dated this 1st day of July 2002

S4 Technology Pty Ltd

By their Patent Attorneys.

WALSH & ASSOCIATES

Figure 1

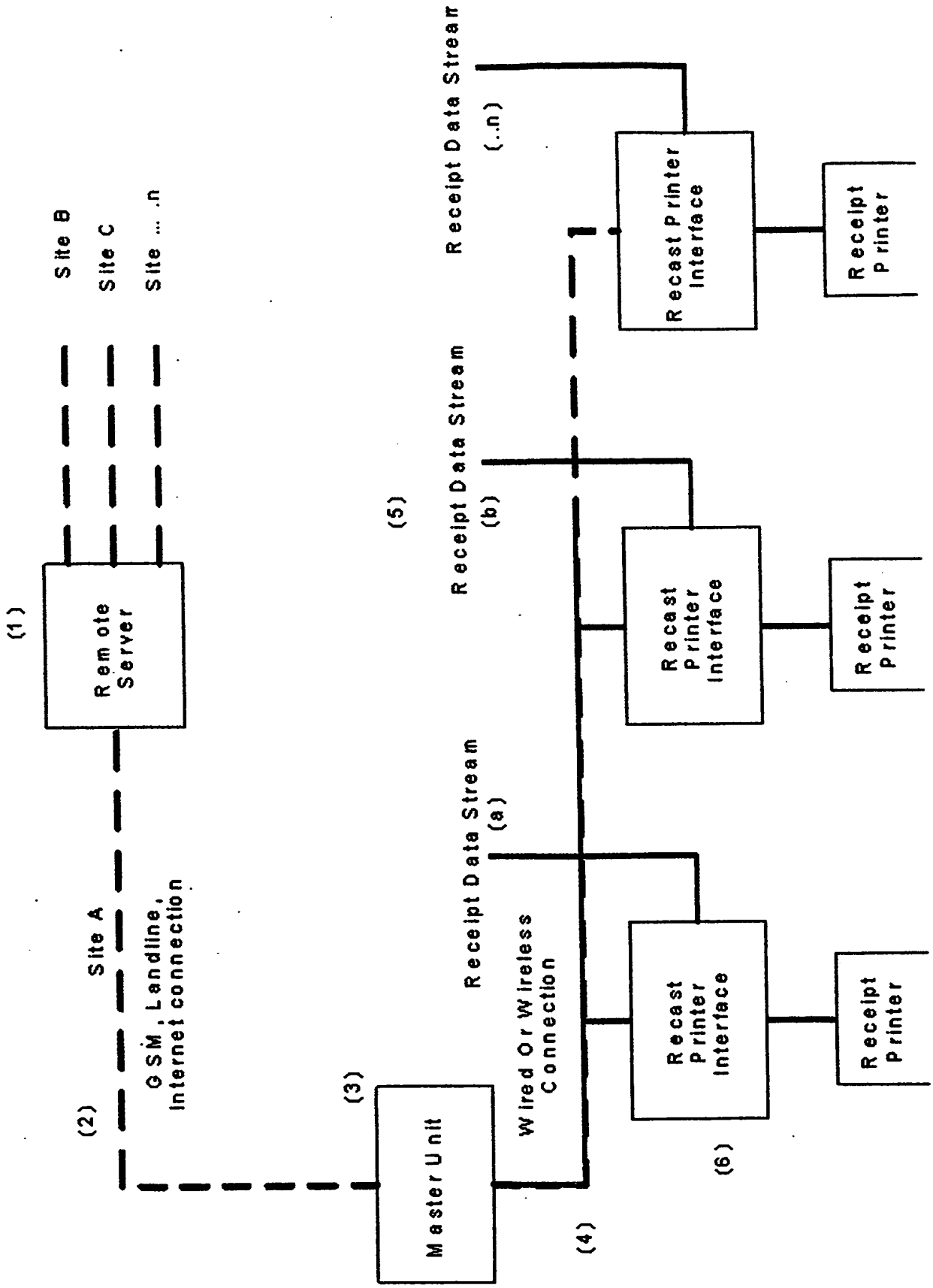

Figure 2

Data-Stream example for Cosmetic, Voucher, and game application